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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/089,430	03/29/2002	Tetsujiro Kondo	450108-03399	6919
20999	7590	12/02/2005	EXAMINER	
FROMMER LAWRENCE & HAUG 745 FIFTH AVENUE- 10TH FL. NEW YORK, NY 10151			HAN, QI	
			ART UNIT	PAPER NUMBER
			2654	

DATE MAILED: 12/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	10/089,430		KONDO ET AL.	
	<b>Examiner</b>		<b>Art Unit</b>	
	Qi Han		2654	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☒ Claim(s) 1-18 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>02/29/02 &amp; 09/13/04</u> . | 6) <input type="checkbox"/> Other: ____.  |

## DETAILED ACTION

### *U.S.C. National Stage Application*

1. Acknowledgement is made of the indication that the present application is filed under 35 U.S.C. 371, of the indication that the required form PCT/DO/ED/903 is present, and of the use of transmittal form PCT/DO/EO/1390. Thus, the present application is being treated as a filing under 35 U.S.C. 371.

### *Priority*

2. Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) or under 35 U.S.C. 120, 121, or 365(c) is acknowledged.

### *Information Disclosure Statement*

3. The references listed in the Information Disclosure Statement submitted on 02/29/2002 and 09/13/2004 have been considered by the examiner (see attached PTO-1449).

### *Specification and Drawing*

4. The disclosure is objected to because of the following:

- a. on page 6, paragraph 3, the terms "the **data level** of each class tap" is unclear.

Appropriate correction or explanation is required.

- b. on page 12, paragraph 5, it recites that "multiplies the current data cut out, by the Hamming window" that is defined by the equation (4), but the equation is different from the well-known Hamming window definition, so that it cannot properly perform the traditional Hamming window functionality. Appropriate correction or explanation is required.

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c. on page 13, paragraph 2, the referenced label “u” is not shown in equation (4), as described. Appropriate correction is required.

d. on pages 14-15, the disclosure appears to compare the correlation coefficient of “small” window with that of “large” window based on equation (5); however, it is unclear how to exactly compare the correlation coefficients, which have different numbers (N) of samples, delay variable t, different length of Hamming window, and different weight factor in the window caused by Hamming window. Applicant fails to show that the disclosed equations result from correct mathematical reasoning. For example, when calculating correlation function using two Hamming windows with different sizes applied to a signal, the results will be effected by weight factor of the two windows respectively, particularly for the data near the beginning and ending part of the windows, so that the results lack fidelity of the comparison measurement. Appropriate correction or explanation is required.

e. on page 15, paragraph 2, the terms “a big difference”, “extremely different” and “an abnormal condition with no similarity” does not provide specific measurable value, range, or boundary for implementing the comparison and making decision, similar for the terms “no big difference between (A and B)” and “normal conditions with similarity”, on page 16, paragraph 2. Appropriate correction or explanation is required.

f. The application keeps saying that “the sound quality should be improved”, “the sound quality is improved”, “the audio quality is significantly improved”, “the sound quality is improved to the degree sufficient for practical use”, (page 10, paragraph 2, page 12, paragraph 2, page 19, paragraph 1, page 29, paragraph 2, and so on). However, the disclosure does not provide persuasive evidence to proof it. For example, a pure speech signal (audio sound) as

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input passing through the claimed invention system, cannot be improved in terms of “sound quality”, at least no evidence shown in the application. Appropriate correction or explanation is required.

g. on page 26, equation 10, it appears that the equation has a duplicated part on the right side. Appropriate correction is required.

h. on page 28, equation 10, the disclosure says “in the learning circuit 30 (see Fig. 8), the student signal generating filter 37 conducts the thinning processing of ... **taking the interpolation processing in the audio signal processing device 10 into consideration ...**” It fails to disclose that what relationship is between device 30 and device 10. It also lacks an antecedent basis for the interpolation processing in device 10. Appropriate correction or explanation is required.

Since many errors are found as stated above, the lengthy specification has not been checked to the extent necessary to determine the presence of all possible errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification. It is reminded that there is no new subject matter allowed in the future amendment. It is also reminded that if a new subject matter has to be added to or any material change has to be added by amendment for in the original specification, in order to satisfy requirement of 35 USC 112 for the claimed limitations, filing a CIP is a proper solution.

### *Claim Objections*

5. Claim 1-18 are objected to because of the following:

Regarding claims 1-18, the claimed limitation is about processing “**digital signal**”, which has much broader scope than that of processing “digital **audio** signal (audio data)” described in the specification (see page 4, paragraph 5 and Fig. 1). Further, an inappropriate broad claim limitation may cause scope problem and/or enablement problem under 35 USC 112 1<sup>st</sup>, for example, processing a digital image signal (data), which is not disclosed at all in the instant application. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 3, 6, 9, 12, 15 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 3, the claim recites the limitation “eliminating the **amplitude element** of the digital signal” in last line of the claim. There is insufficient antecedent basis for the limitation in the claim.

Regarding claims 6, 9, 12, 15 and 18, the claims have the same situation as claim 3, so that the rejection is based on the same reason as claim 3 (see above).

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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7. Claims 1-18 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Regarding claim 1, the limitation “classifying the parts into a class based on the calculation results of the self correlation coefficients” has an enablement problem, because the application fails to define and/or describe specific relationship between the classifying the parts and the calculation results of the self correlation coefficients (see closest disclosure in equations 2 and 5). It is noted that the application does disclose classifying the part into a class (equation 2), calculating the self correlation coefficients (equation 5) and mentions the claimed limitation (page 10, paragraph 2 to page 11, paragraph 1) individually, but it fails to show how the classified class is specifically **based on** self correlation calculation, such that an ordinary person would not know how to implement the claimed limitation. Further, this enablement problem is also related to the disclosure objection b and d (see above). Therefore, the limitation was not described in the specification in such a way as to enable one skilled in the art to make and/or use the claimed invention without undue experimentation.

Regarding claims 4, 7, 10, 13 and 16, the rejection is based on the same reason described for claim 1, because the claims recite the same or similar limitations as claim 1, respectively.

Regarding claims 2-3, 5-6, 8-9, 11-12, 14-15 and 17-18, the rejection is based on the same reason described for their parent claims, because the dependent claims inherit all limitations as their parent claims.

In addition, regarding claim 3, the limitation “the self correlation coefficients are calculated after eliminating the amplitude element of the digital signal” has its own enablement problem, because according to Equation (5) (see specification, page 13), the signal waveform  $g(i)$  or  $g(i+t)$  corresponds to the amplitude element of the digital signal and is used for calculating the self correlation. At this point, the claimed limitation directly conflicts the disclosure in the specification. Further, if the amplitude element of the digital signal is eliminated, the self-correlation cannot be calculated at all. Therefore, the claimed limitation was not described in the specification in such a way as to enable one skilled in the art to make and/or use the claimed invention without undue experimentation.

Similarly, claims 6, 9, 12, 15 and 18, have the same problem as claim 3 since they recite the same or similar limitation as claim 3, so that the rejection is based on the same reason as described for claim 3.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-2, 4-5, 7-8, 10-11, 13-14 and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over IMAI et al. (US 6,360,198 B1) hereinafter referenced as IMAI in view of THYSSEN (US 2002/0138256 A1).



As per **claim 1**, as best understood in view of the claim objection and claim rejection under 35 USC 112 1<sup>st</sup> (see above), IMAI discloses ‘audio processing method, audio processing apparatus, and recording reproduction apparatus cable of outputting voice having regular pitch regardless of reproduction speed’ (title), comprising:

“a step of cutting parts out of the digital signal by plural windows having different sizes and calculating their respective self correlation coefficients” (col. 2, lines 20-26, ‘after having performed digital signal processing on the audio data’; col. 7, lines 22-26, ‘performing (calculating) auto-correlation (self correlation) analysis (necessary including the correlation coefficients) for each of the voiced sound, unvoiced sound, and silent...’ ; col. 7, line 62 to col. 8, line 15, ‘auto-correlation analysis is performed using a plurality of window widths (corresponding to plural windows having different sizes) having different values’);

“a step of classifying the parts into a class based on the calculation results of the self correlation coefficients”, (col. 7, lines 20-26, ‘classifying the resulting data into voiced sound, unvoiced sound, and silent...processing of performing auto-correlation (self correlation) analysis for each of the voiced sound, unvoiced sound, and silent’; Fig. 1) ; and

“a step of generating a new digital signal which is obtained by the digital signal”, (col. 8, lines 20-26 and Fig. 1, ‘supplies (generates) the thus-read-out data (new digital signal) to the audio data connection’).

But, IMAI does not expressly disclose generating the new digital signal “by prediction-operating the digital signal by a prediction method corresponding to the obtained class”

However, this feature is well known in the art as evidenced by THYSEN who discloses ‘low complexity random codebook structure’ (title), and teaches ‘efficient signal representations can

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be determined by estimating and applying certain prediction parameters to represent the signal (prediction-operating the digital signal)' (paragraph 4). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify IMAI by specifically providing a mechanism for estimating and applying certain prediction parameters to represent the signal, taught by THYSEN, for the purpose (motivation) of modeling a signal value according to an earlier value (THYSEN: paragraph 4).

As per **claim 2** (depending on claim 1), IMAI in view of THYSEN further discloses "at least a general searching range and a local searching range are provided as targets for calculating the self correlation coefficients with respect to the digital signal, and the self correlation coefficients are calculated based on the searching ranges", (THYSEN: paragraph 82, 'the autocorrelations of the windowed speech are computed'; 'paragraphs 115-139, 'estimation of the precise pitch lag... based on the normalized correlation (self correlation)', 'the size L is defined according to open-loop pitch lag  $T_{op}$  with the corresponding normalized correlation', and 'one integer k is maximizing the  $R_k$  (the normalized correlation) in the range  $[T_{op} - 10, T_{op} + 10]$  (local range) bounded by [17-145] (general range)' and other related ranges; paragraphs 143-160, 'local integer shifting range [SR0, SR1] (local range, herein the range  $[T_{op} - 10, T_{op} + 10]$  is referred as global range) for searching').

Regarding claims 4 and 7, the rejection is based on the same reason described for claim 1, because the claims recite the same or similar limitations as claim 1, respectively.

Regarding claims 5 and 8, the rejection is based on the same reason described for claim 2, because the claims recite the same or similar limitations as claim 2, respectively.

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As per **claim 10**, as best understood in view of the claim objection and claim rejection under 35 USC 112 1<sup>st</sup> (see above), the rejection for claimed elements 2-4 (herein corresponding to steps 2-4) is based on the same reason described for claim 1, because the elements recite the same or similar limitations as claim 1. In addition, regarding claimed element 1, IMAI in view of THYSSEN further discloses “a step of generating, from a desired digital signal, a student digital signal in which the digital signal is degraded”, (IMAI: col. 2, lines 443-44, ‘thinning of the audio data’; col. 7, ‘decimation processing of decreasing the sampling rate of the audio data’, which inherently causes the audio signal (data) degraded, as claimed).

Regarding claim 11 (depending on claim 10), the rejection is based on the same reason described for claim 2, because the claim recites the same or similar limitations as claim 2.

Regarding claims 13 and 16, the rejection is based on the same reason described for claim 10, because the claims recite the same or similar limitations as claim 10, respectively.

Regarding claims 14 and 17, the rejection is based on the same reason described for claim 11, because the claims recite the same or similar limitations as claim 11, respectively.

### *Conclusion*

9. Please address mail to be delivered by the United States Postal Service (USPS) as follows:

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Effective January 14, 2005, except correspondence for Maintenance Fee payments, Deposit Account Replenishments (see 1.25(c)(4)), and Licensing and Review (see 37 CFR 5.1(c) and 5.2(c)), please address correspondence to be delivered by other delivery services (Federal Express (Fed Ex), UPS, DHL, Laser, Action, Purolater, etc.) as follows:

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Qi Han whose telephone numbers is (571) 272-7604. The examiner can normally be reached on Monday through Thursday from 9:00 a.m. to 7:00 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil, can be reached on (571) 272-7602.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Inquiries regarding the status of submissions relating to an application or questions on the Private PAIR system should be directed to the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or 703-305-3028 between the hours of 6 a.m. and midnight Monday through Friday EST, or by e-mail at: [ebc@uspto.gov](mailto:ebc@uspto.gov). For general information about the PAIR system, see <http://pair-direct.uspto.gov>.

QH/qh  
November 16, 2005

  
RICHEMOND DORVIL  
SUPERVISORY PATENT EXAMINER